patersongroup

Consulting Engineers

154 Colonnade Road South
Ottawa, Ontario
Canada K2E 7J5
Tel: (613) 226-7381
Fax: (613) 226-6344

Geotechnical Engineering
Environmental Engineering
Hydrogeology
Geological Engineering
Materials Testing
Building Science

www.patersongroup.ca

February 15, 2013
File No. PM6843-01

Uganda High Commission
231 Cobourg Street
Ottawa, Ontario
K1N 8J2

Attention: **Mr. Joshua Kalebo**

Subject: **Geotechnical Assessment**
231 Cobourg Street, Ottawa, Ontario

Dear Mr. Kalebo:

Further to your request and authorization, Paterson Group have conducted a geotechnical assessment at the existing building located at 231 Cobourg Street in Ottawa, Ontario.

The building is a two storey structure, with a basement and a flat roof. The building is located at the northeast corner of the intersection of Cobourg Street and Wilbrod Street. The exterior finish consists of brick. The foundation walls are comprised of a combination of masonry blocks and cast-in-place concrete. It is our understanding that the building was constructed in 1930, and that previous repairs were conducted approximately 10 years ago.

The north end of the basement was evidently used as a garage in the past. The garage door openings were evidently blocked in. Portions of the foundation wall were replaced near the northwest corner in the past. The pattern of previously patched cracks in the bricks and masonry blocks would suggest that the north end of the building experienced significant settlement in the past. There are also older cracks in the basement floor slabs at the north end of the building. Some of the older cracks have reopened slightly. Newer cracks were observed in the basement floor slab, approximately parallel to the east wall. Cracks were observed in interior walls that run east to west. The pattern of damage would suggest that the east wall has settled significantly rather recently.

A multi-trunk deciduous tree, with trunk diameters of 300 to 400 mm, is located approximately 4 m from the northeast corner of the building. A row of trees (mainly deciduous with some conifers) is located along the east edge of the property, at approximately 2 to 3 m from the east wall of the building. Two Maple type trees, with trunk diameters of approximately 300 mm, are located approximately 7 m from the south wall.

In order to determine the nature of the foundation soils, a series of five test holes were made through the basement floor slab, on February 12, 2013. The initial test hole is located at the northeast corner. The footing is rough formed and projects 180 mm past the interior face of the east foundation wall. The top of footing is just below the floor slab, and the footing is 300 mm thick. Finishing elements obscured the contact between the foundation wall and footing. The footing was found to be in contact with very stiff clay. Tree roots up to 50 mm in diameter were found in the soil below the footing. A hand auger hole pud down adjacent to the footing terminated in very stiff clay at a depth of 1.5 m below the underside of footing. Our observations in this hand auger hole are shown on the enclosed Soil Profile and Test Data sheet for HA 1.

The second test hole is located on the east side of an interior block wall in the northwest quadrant of the building, against the north wall. At this location, the rough concrete footing was found to be 250 mm thick under the north perimeter wall and 150 mm thick below the interior wall. The footings have narrow projections in that area. Small tree roots were found in the soil below the footing. The block wall was found to be in contact with the footing and the footing was found to be in contact with very stiff clay.

The third test hole is located at the northwest corner of the basement. At this location, the footing projects 180 mm past the interior face of the west foundation wall and 300 mm past the interior face of the north foundation wall. The foundation walls were observed to be in contact with the footings. The formed concrete footing was found to be 380 mm thick, and in contact with very stiff clay. A hand auger hole put down adjacent to the footing terminated in very stiff clay, at a depth of 1.5 m below underside of footing. Our observations in the hand auger hole at this location are shown on the enclosed Soil Profile and Test Data sheet for HA 2.

The fourth test hole is located adjacent to the west foundation wall, in the room north of the boiler room. At this location, the footing projects 180 mm past the interior face of the west foundation wall, and is 330 mm thick. The foundation wall was found to be in contact with the footing and the footing was found to be in contact with very stiff clay. Tree roots up to 15 mm in diameter were found in the soil below the footing.

The fifth test hole is located adjacent to the east foundation wall, in the southeast room of the basement. The footing was found to project 165 mm past the interior face of the east foundation wall and is 355 mm thick. The foundation wall was found to be in contact with the footing and the footing was found to be in contact with very stiff clay. A hand auger hole put down adjacent to the footing terminated in stiff clay, at a depth of 1.5 m below the underside of footing. Water was not found in the hand auger holes. Our observations in this hand auger hole are shown on the enclosed Soil Profile and Test Data sheet for HA 3.

Based on the results of in situ vane shear strength tests, the clay bearing medium would have an allowable bearing pressure of 150 kPa.

Based on our observations, the recent damage observed is considered to be related primarily to settlement associated with moisture depletion of the underlying clay soils. The clay encountered is considered to be a sensitive marine clay, and is susceptible to shrinkage on drying. Factors in overall moisture depletion and ground water lowering are considered to be the effects of urbanization and the hotter and drier than normal weather experienced since the late 1990's, related to global climate change. There was a prolonged drought in the second half of 2011 and the first 8 months of 2012. Localized moisture depletion is considered to be related significantly to factors such as the moisture demand of nearby trees, in conjunction with the drought.

In this regard, it is recommended that the water demand of the nearby trees be addressed. It is recommended that the trees located within 8 m of the building be killed and removed, before the growing season. It is our understanding that a large tree was removed from near the northwest corner approximately 10 years ago.

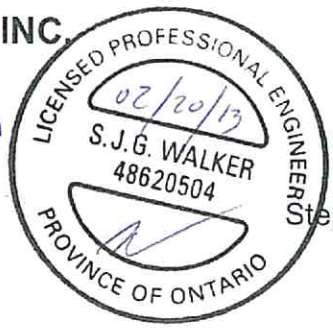
It should be noted that the soil and structure are not immobile, and as such the potential exists for cracks to reopen due to normal soil movements. Continued moisture depletion and water table lowering, due to global climate change, could also result in additional settlement.

The movements reported in the past may be related to settlement associated with moisture depletion, and/or to movement associated with frost action. The clay is a frost susceptible soil. If the footings lacked soil cover during the time period that the underground parking was in operation, the potential would have existed for movement related to frost action. However, the damage pattern is more consistent with settlement.

We trust that this submission meets your current requirements. If you have any questions, or if further works are requested at this time, do not hesitate to call.

Yours truly,

PATERSON GROUP INC.



M. Laird Stewart, C.E.T.

Stephen J. Walker, P.Eng.

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Assessment of Founding Soils
231 Cobourg Street
Ottawa, Ontario

DATUM

FILE NO. **PM6843**

REMARKS In test pit, through basement floor, at northeast corner.

HOLE NO. **HA 1**

BORINGS BY Hand Auger DATE February 12, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
Underside of Footing						0		20 40 60 80	
Very stiff, olive **CLAY** - tree roots up to 50mm diameter under footing						1			
1.50									
End of Hand Auger Hole (HA dry upon completion)									

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Assessment of Founding Soils
231 Cobourg Street
Ottawa, Ontario

DATUM

FILE NO. **PM6843**

REMARKS In test pit, through basement floor, at northwest corner.

HOLE NO. **HA 2**

BORINGS BY Hand Auger DATE February 12, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
Underside of Footing						0			
Very stiff, olive **CLAY**						1			
1.50									
End of Hand Auger Hole									
(HA dry upon completion)									

Water Content % scale: 20 40 60 80

Shear Strength (kPa) scale: 20 40 60 80 100

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Assessment of Founding Soils
231 Cobourg Street
Ottawa, Ontario

DATUM

FILE NO. **PM6843**

REMARKS In test pit, adjacent to east wall footing, in southeast room of basement.

HOLE NO. **HA 3**

BORINGS BY Hand Auger DATE February 12, 2013

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE OR RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	Piezometer Construction
Underside of Footing						0			
Very stiff to stiff, olive **CLAY**						1			
1.50									
End of Hand Auger Hole (HA dry upon completion)